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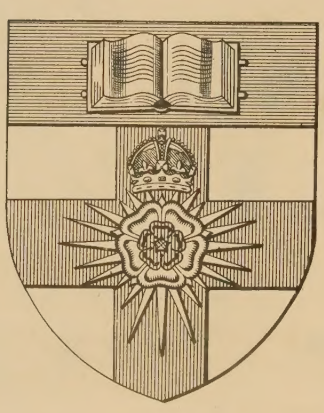

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CATALOGUE

OF

SCIENTIFIC PAPERS

1800—1900

SUBJECT INDEX

VOLUME III

PHYSICS

PART I

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ROYAL SOCIETY OF LONDON

CATALOGUE
OF
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1800–1900

SUBJECT INDEX

VOLUME III

PHYSICS

PART I

GENERALITIES, HEAT, LIGHT, SOUND

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CAMBRIDGE:
AT THE UNIVERSITY PRESS
1912

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ARRANGED FOR A COMMITTEE OF THE ROYAL SOCIETY
UNDER THE SUPERINTENDENCE OF

HERBERT McLEOD, LL.D., F.R.S.

DIRECTOR OF THE CATALOGUE

with the assistance of

ALICE EVERETT, M.A., R. HARGREAVES, M.A.,
AND W. MARSHALL WATTS, D.Sc.

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PREFACE

IN the Preface to the Volume forming the Subject Index to the papers on Pure Mathematics for the nineteenth century, published in 1908, an outline of the history of the Royal Society's Catalogue of Scientific Papers is given; it is not necessary to repeat that account.

Volume II of the Subject Index, dealing with the papers on Mechanics, was published in 1909.

The present volume deals with the papers on Physics, as classified in the schedule of the International Catalogue of Scientific Literature. As it was found that the number of entries in this subject was too large for a single volume, the Committee decided that it should be published in two Parts, the first volume containing the entries classed under Generalities, Heat, Light and Sound, and the second those on Electricity and Magnetism. Part I contains 33344 entries referring to the papers contained in 1261 serial publications.

This order differs from that of the International Catalogue, in which Sound follows Electricity and Magnetism; the Registration Numbers are here retained, but the numbers 8990 to 9520, dealing with Sound, are interpolated between 4470 and 4900.

The Index titles were prepared in the same manner as those for Volumes I and II. Papers published from 1884 to 1900 inclusive were consulted by Referees familiar with the subjects, so that the Index titles were made from the contents of the papers and not merely from the headings. For the years from 1800 to 1883, it had been intended that the Index entries should be made from the titles in the published twelve volumes of the Catalogue arranged according to Authors' names; but it has been found necessary in a large number of cases to refer to the original papers, as the headings of the papers were not sufficiently definite to enable the Referees to classify the contents.

With the object of expediting the publication of the Physics volume, three of the Referees who assisted in the preparation of the Index titles were invited to help in sorting the slips for the Press. Mr R. Hargreaves

undertook the section on Heat, Dr W. Marshall Watts that on Light and Miss Alice Everett that on Sound.

The subjects are arranged under the registration numbers adopted in the International Catalogue of Scientific Literature; a copy of Schedule C (Physics) of that Catalogue, as revised in 1905, is prefixed to the Index, with indication of the pages on which the titles for the different sections occur. It has occasionally been found convenient, in order to save repetition in printing, to group entries under a sub-heading which is not contained in the International Catalogue Schedule. Where this has been done the sub-heading is printed in italics. In some of these cases the words of the sub-heading are understood to exist before the entries following them, and consequently these entries commence with small letters. These minor classifications, being often made mechanically on the basis of the explicit mention of the sub-heading, are not to be taken as exhaustive; cognate entries may be found elsewhere under the same main heading. The unit of classification is thus the complete numbered heading.

At the end of the volume will be found an alphabetical index to the subdivisions under which the subject titles have been arranged; this will much facilitate reference. The index also contains references to important subjects included within some of the subdivisions but without separate headings.

The entries in the Index are arranged so that reference can be made, if necessary, to the complete titles in the Catalogue of Scientific Papers. Generally the author's name together with the date will indicate the volume in which the title of the paper may be found in full. But these clues are insufficient when the paper is anonymous, or occurs in Volume XII or in the additions to Volume VI. They are also at fault for titles marked with an asterisk showing that they belong to previous volumes; in these cases the number of the volume is given in the Index entry in small Roman numerals within brackets. The references have been made as short as possible; thus the number of only the initial page of each paper has been given; but the length of the paper may be found by reference to the Catalogue of Authors.

When an error has been found in an author's name in the Catalogue, it is corrected in the Index and a reference made to the error.

The Index contains references to some papers, of dates earlier than 1884, which were omitted in previous volumes of the Catalogue; these are indicated

by an asterisk placed before the date. The full titles of these papers will be given in the continuation of the Catalogue of Authors.

When an author's personal name does not appear in the original heading of a paper, no attempt has been made to find the name for the Index; but this will be done for the Catalogue of Authors.

Entries on the same subject are arranged, so far as possible, in order of date irrespective of the authors' names, with the endeavour to present the subject in the historical form. This grouping of the entries, involving modifications of titles prepared by different Referees, or by the same Referee at different times, has been one of the most difficult problems in the preparation of the Index.

The abbreviations used in the Royal Society Catalogue for the names of the serials have been further shortened for the Index. As the abbreviations are not uniform in all the volumes, it will be found that the same journal may be indicated by several different abbreviations; but in each case the one selected is that which was used in the volume in which the title of the paper occurs.

In the case of serials commencing since 1883, the abbreviations adopted in the International Catalogue have been used as a guide.

The list of serials will, as in the case of Pure Mathematics, be a valuable feature of the Index. It contains the names of 1261 serials from which the entries in the Index have been taken. Each title is preceded by the abbreviation which represents the serial in the Index; the date of commencement of the serial is given, and if it is extinct the date of the last volume is added. There are appended symbols representing the names of thirty British Libraries in some of which the serials may be found; where the set is incomplete the symbol is followed by *i*. The information from which this list has been compiled was obtained, in the first instance, from published catalogues; subsequently the list was submitted to the custodians of many of the libraries, who kindly marked many serials which had not been found in the catalogues used. The thanks of the Committee for this valuable assistance are due to Mr F. Jenkinson of the Cambridge University Library, the late Mr E. W. B. Nicholson and Mr F. Madan of the Bodleian Library, the Librarian of the Radcliffe Library, the Librarian of the Cambridge Philosophical Society, Mr F. W. Clifford of the Chemical Society, to Mr R. Lloyd Praeger for obtaining information from the five Libraries in Dublin,

Mr J. Hardy of the Royal Society of Edinburgh, Mr C. V. Crook of the Geological Museum, Mr Rupert Jones of the Geological Society, Mr J. Knight of the Royal Philosophical Society, Glasgow, Mr F. C. Nicholson of the University, Glasgow, Dr J. H. T. Tudsbery of the Institution of Civil Engineers, Dr B. Daydon Jackson, and Mr A. W. Kappel of the Linnean Society, the Librarian of the London Mathematical Society, Mr J. W. Knapman of the Pharmaceutical Society, Mr E. W. Hulme of the Patent Office Library, Mr W. H. Wesley of the Royal Astronomical Society, Mr F. Allen of the Royal Geographical Society, Mr R. W. Chambers of University College, London, Mr L. W. Fulcher of the Science Library, Science Museum, South Kensington, Dr W. N. Shaw, F.R.S., Director of the Meteorological Office, and Mr V. G. Plarr, Librarian of the Royal College of Surgeons.

Although much care has been expended in making this list as accurate as possible, it is probable that some errors will still be found, and the Director will be thankful to any one who will send corrections: portions of the list will be required for the subsequent volumes of the Index.

The following Referees have assisted at various times in the preparation of the Subject Index in Physics: Miss Alice Everett, Miss Burna Pool, Mr R. J. Dallas, Mr W. A. Davis, Mr R. Hargreaves, Dr R. A. Lehfeldt, Mr W. Lowson, Mr H. E. Schmitz, Mr J. H. Shaxby and Dr W. Marshall Watts. The Committee is indebted to them for much valuable help.

Dr W. Marshall Watts has given special assistance and supervision in the preparation of the Index titles. To him, and to Miss Bremner and the other members of the Catalogue Staff of the Royal Society, thanks are due for careful and conscientious work.

The Committee is indebted to the authorities of the British Museum, of the Natural History Museum, of the Royal College of Surgeons, of the Patent Office and of the Meteorological Office for facilities given to the type writers and revisers of the Catalogue staff in copying titles of papers from the books in the libraries, and also to the Cambridge University Library, the Chemical Society, the Geological Society, the Linnean Society, the Royal Astronomical Society, the Royal Geographical Society and the Alpine Club for the loan of books for the preparation of the Catalogue.

Besides these Libraries others have been consulted and the Committee gratefully acknowledges the assistance that has been received.

Preface

The Committee desires to renew the record of its gratitude to the late Dr Ludwig Mond, F.R.S., for his generosity in providing funds for carrying on the work of the Catalogue, in which he took so keen an interest. Without his help it would hardly have been possible to proceed with the Catalogue in its present complete form; by his decease the members of the Committee have been deprived of a stimulating colleague who had been active in the planning of the work almost from the beginning.

The final section of the Catalogue of Scientific Papers arranged according to Authors' names, that for the period 1884 to 1900, is in active preparation. The material has now been all collected and it is hoped that the printing may soon be commenced.

The Syndics of the Cambridge University Press have undertaken the complete risk of printing and publishing, as regards both the Catalogue of Scientific Papers and the Subject Index. It will be the care of the Committee, and it is hoped of the Scientific world generally, to use their best endeavours that this public-spirited action shall not result in financial loss.

The thanks of the Committee are due to the officials of the Cambridge Press for their unfailing courtesy in the discharge of a complex task.

October, 1912.

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LIST OF SERIAL PUBLICATIONS

WITH THE ABBREVIATIONS OF THEIR TITLES USED IN THE INDEX, AND LIBRARIES WHERE THE SERIALS CAN BE CONSULTED.

The date following the title of a serial indicates the year of publication of the first volume; if a second date is given it marks the termination of the serial.

The letters following the dates indicate libraries where the serials are to be found: if the serial is incomplete, the symbol of the library is followed by *i.*

B.M.	British Museum.	Linn.S.	Linnean Society.
Camb.P.S.	Cambridge Philosophical Library.	Math.S.	Mathematical Society.
Camb.U.	Cambridge University Library.	M.O.	Meteorological Office, South Kensington.
Chem.S.	Chemical Society..	N.H.M.	Natural History Museum.
Dub.N.L.I.	National Library of Ireland, Dublin.	Oxon.B.	Bodleian, Oxford.
Dub.R.C.S.	Royal College of Science, Dublin.	Oxon.B.(R.)	Deposited in Radcliffe.
Dub.R.D.S.	Royal Dublin Society.	Oxon.R.	Radcliffe, Oxford.
Dub.R.I.A.	Royal Irish Academy, Dublin.	Pharm.S.	Pharmaceutical Society, London.
Dub.T.C.	Trinity College, Dublin.	P.O.	Patent Office, London.
Edinb.R.S.	Royal Society of Edinburgh.	R.A.S.	Royal Astronomical Society.
Edinb.U.	Edinburgh University.	R.C.Surg.	Royal College of Surgeons.
Geol.M.	Geological Survey Museum, Jermyn St.	R.Geogr.S.	Royal Geographical Society.
Geol.S.	Geological Society.	R.S.	Royal Society.
Glasg.P.S.	Royal Philosophical Society of Glasgow.	S.K.	Science Museum Library, South Kensington.
Glasg.U.	Glasgow University.	U.C.L.	University College, London.
I.CE.	Institution of Civil Engineers, London.		

A. Agn. ..... Annales Agronomiques.... Paris.
1851; 1875— B.M.; Chem.S.*i.*; Linn.S.; Oxon.B.; P.O.*i.*; R.S.*i.*

Aarau Arch. Md. ..... Archiv der Medizin, Chirurgie, und Pharmacie. Aarau.
1816—17. R.S.

Aarau Mt. ..... Mittheilungen der Aargauischen Naturforschenden Gesellschaft. Aarau.
1878— N.H.M.; R.S.; S.K.

A. C. ..... Annales de Chimie [et de Physique], ou Recueil de Mémoires concernant la Chimie et les Arts qui en dépendent. Paris.
1789— B.M.; Camb.U.; Chem.S.; Dub.R.D.S.*i.*; Dub.T.C.*i.*; Edinb.R.S.; Edinb.U.; Glasg.U.; I.CE.; N.H.M.; Oxon.B.*i.*(R.); Pharm.S.; P.O.; R.C.Surg.; R.S.; S.K.; U.C.L.

A. C. Anal. ..... Annales de Chimie Analytique appliquée à l'Industrie, à l'Agriculture, à la Pharmacie et à la Biologie. Paris.
1896— Chem.S.*i.*; P.O.

Ac. Cæs. Leop. N. Acta ... Nova Acta physico-medica Academiæ Cæs. Leopoldino-Carolinæ Naturæ Curiosorum. Erlangen, Bonn, Breslau.
1758— Camb.P.S.; Camb.U.; Chem.S.*i.*; Dub.T.C.; Edinb.R.S.*i.*; Edinb.U.; Geol.S.*i.*; Glasg.U.; Linn.S.*i.*; N.H.M.; Oxon.R.; Pharm.S.*i.*; R.A.S.*i.*; R.C.Surg.; R.S.; S.K.*i.*; U.C.L.*i.*
See **Ac. Nt. C. N. Acta** *and* **Cæs. Leop. Ac. N. Acta.**

Acireale Ac. At. .... Atti e Rendiconti dell' Accademia di Scienze, Lettere e Arti dei Zelanti e PP. dello Studio di Acireale. Acireale.
1890— Camb.P.S.*i.*; Geol.S.*i.*; N.H.M.*i.*; R.S.*i.*

Ac. Nt. C. N. Acta .. ... *See* **Ac. Cæs. Leop. N. Acta** *and* **Cæs. Leop. Ac. N. Acta.**

A. Cond. Pon. Chauss. ... Annales des Conducteurs des Ponts et Chaussées; Recueil de Mémoires, etc., concernant le Service de Conducteurs des Ponts et Chaussées. Paris.
1857— I.CE.*i.*; P.O.

A. Cons. Arts et Mét. ... Annales du Conservatoire des Arts et Métiers. Paris.
1861— B.M.; Camb.U.; Glasg.P.S.*i.*; I.CE.*i.*; Oxon.B.; P.O.; R.S.; S.K.*i.*
See **Par. A. Cons.**

A. C. Phm. ..... Annalen der Chemie und Pharmacie. Lemgo, Leipzig, Heidelberg.
1832— B.M.; Camb.U.; Chem.S.; Dub.N.L.I.*i.*; Dub.R.C.S.*i.*; Edinb.R.S.*i.*; Edinb.U.; Glasg.P.S.; Glasg.U.*i.*; N.H.M.; Oxon.R.; Pharm.S.*i.*; P.O.; R.C.Surg.*i.*; R.S.; S.K.; U.C.L.*i.*
See **Lieb. A.**

Acta Mth. ..... Acta Mathematica. Stockholm.
1882— B.M.; Camb.P.S.; Camb.U.; Dub.T.C.; Edinb.R.S.; Edinb.U.; Glasg.U.; Math.S.; Oxon.R.; R.A.S.; R.S.; U.C.L.

Act. S. Helv. ..... Actes de la Société Helvétique des Sciences Naturelles. Lausanne, etc.
1825— B.M.*i.*; Edinb.R.S.*i.*; Linn.S.*i.*; N.H.M.; S.K.
See **At. S. Elvet., Sch. Gs. Vh.** *and* **Sch. Nf. Gs. Vh.**

A. das Sc. ..... Annaes das Sciencias, etc. por huma Sociedade de Portuguezes residentes em Paris. Paris.
1818—27. B.M.; Camb.U.*i.*
See **Par. A. das Sc.**

A. der Hydrog. ..... Annalen der Hydrographie und Maritimen Meteorologie. Herausgegeben von der Deutschen Seewarte in Hamburg. Berlin.
1875— [*Continuation of:* Hydrographische Mittheilungen, 1873—74.] B.M.; M.O.; P.O.*i.*; R.Geogr.S.

A. di C. ..... Annali di Chimica. Milano.
1845—97. [*Continued as:* Annali di Farmacoterapia e Chimica, 1898—] B.M.; Camb.U.*i.*; Chem.S.*i.*; Pharm.S.*i.*; P.O.*i.*
See **Polli A.**

A. di Fm. e C. ..... Annali di Farmacoterapia e Chimica. Milano, Bologna, etc.
1898— [*Continuation of:* Annali di Chimica, 1845—97.] B.M.; Camb.U.*i.*; Chem.S.; Glasg.P.S.*i.*; P.O.

A. d'Ocul. ..... Annales d'Oculistique. Charleroi, Bruxelles, Paris.
1838— B.M.; Camb.U.*i.*; Oxon.R.*i.*; R.C.Surg.

Aér. ..... L'Aéronaute. Bulletin Mensuel Illustré de la Navigation Aérienne. Paris.
1868— B.M.*i.*; P.O.; S.K.

Aer. J. ..... The Aeronautical Journal. London.
1897— B.M.; Camb.U.*i.*; I.CE.*i.*; P.O.; R.S.; S.K.

Aër. S. Rp. ..... Annual Reports of the Aëronautical Society of Great Britain. London.
1866—93. I.CE.*i.*; Oxon.B.; P.O.

A. Gén. Civ. ..... Annales du Génie Civil; Recueil de Mémoires sur les Mathématiques pures et appliquées; l'Astronomie, la Chimie, la Physique, etc. Paris.
1862—80. B.M.; Camb.U.; Dub.R.C.S.*i.*; I.CE.; P.O.

A. Gén. Sc. Ps. ..... Annales générales des Sciences Physiques. Bruxelles.
1819—21. Camb.U.; Glasg.U.; N.H.M.; R.C.Surg.; R.S.

Ag. S. J. ..... Journal of the Royal Agricultural Society of England. London.
1840— B.M.; Camb.U.; Chem.S.; Dub.T.C.; Geol.M.; Geol.S.; Glasg.U.*i.*; I.CE.; Linn.S.; N.H.M.; Oxon.B.; Oxon.R.; P.O.; R.Geogr.S.; R.S.; S.K.; U.C.L.*i.*

A. Hydrog. ..... Annales Hydrographiques. Recueil d'Avis, Instructions, Documents, et Mémoires relatifs à l'Hydrographie et à la Navigation. Paris.
1849— B.M.; Edinb.R.S.*i.*; M.O.*i.*; Oxon.B.; R.A.S.*i.*; R.Geogr.S.*i.*; R.S.*i.*

A. Hyg. Pbl. ..... Annales d'Hygiène publique [et de Médecine légale]. Paris.
1829— B.M.; Camb.U.; Edinb.R.S.*i.*; Edinb.U.; Glasg.P.S.*i.*; Glasg.U.*i.*; Oxon.R.; P.O.*i.*; R.C.Surg.

Aix Ac. Mm. .....
Aix Mm. .....
Aix Mm. Ac. ..... Mémoires de l'Académie des Sciences, Agriculture, Arts et Belles-Lettres. Aix.
1819— B.M.; Dub.R.I.A.; N.H.M.*i.*; Oxon.B.*i.*; R.S.*i.*

Alb. I. T. ..... Transactions of the Albany Institute. Albany.
1830— B.M.; N.H.M.; R.S.; S.K.*i.*

List of Serial Publications

Al. D. Nt. Ztg. ..... Allgemeine Deutsche Naturhistorische Zeitung. Dresden, Leipzig, Hamburg.
1846—47; 1855—57. B.M.; Glasg.P.S.*i.*; N.H.M.; R.S.; S.K.*i.*

Allier Bll. S. Ém. ..... Bulletin de la Société d'Émulation du Département de l'Allier: Sciences, Arts, et Belles-Lettres. Moulins.
1846—64. B.M.; Glasg.P.S.*i.*; Oxon.B.; R.S.

A. Lndw. ..... Annalen der Landwirthschaft in den K. Preuss. Staaten; herausg. vom Präsidium des K. Landes-Oecon.-Collegiums. Berlin.
1843—71. [*Continued as:* Landwirthschaftliche Jahrbücher, 1872—.] P.O.

Am. Ac. Mm. ..... Memoirs of the American Academy of Arts and Sciences. Cambridge, Boston.
1785— B.M.*i.*; Camb.P.S.; Camb.U.; Dub.R.D.S.*i.*; Dub.R.I.A.*i.*; Dub.T.C.*i.*; Edinb.R.S.; Geol.S.*i.*; I.CE.*i.*; Linn.S.; N.H.M.; Oxon.R.; P.O.*i.*; R.A.S.; R.Geogr.S.*i.*; R.S.; S.K.*i.*; U.C.L.*i.*
See **Bost. Am. Ac. Mm.**

Am. Ac. P. ..... Proceedings of the American Academy of Arts and Sciences. Boston.
1846— B.M.; Camb.P.S.; Camb.U.; Chem.S.*i.*; Dub.R.D.S.; Edinb.R.S.; Geol.S.; Glasg.P.S.; Glasg.U.*i.*; I.CE.*i.*; Linn.S.; Math.S.*i.*; N.H.M.; Oxon.R.; P.O.; R.A.S.; R.Geogr.S.; R.S.; S.K.; U.C.L.*i.*

Am. As. P. ..... Proceedings of the American Association for the Advancement of Science. Washington, Salem.
1848— B.M.*i.*; Camb.P.S.*i.*; Camb.U.; Dub.R.I.A.; Edinb.R.S.*i.*; Glasg.P.S.*i.*; Glasg.U.*i.*; I.CE.*i.*; Linn.S.*i.*; N.H.M.; Oxon.B.; Oxon.R.*i.*; P.O.; R.A.S.*i.*; R.C.Surg.*i.*; R.Geogr.S.*i.*; R.S.; S.K.

Am. C. ..... The American Chemist, a monthly Journal of theoretical Chemistry. New York.
1871—77. Chem.S.*i.*; N.H.M.; P.O.; Pharm.S.*i.*; S.K.*i.*

Am. C. J. ..... American Chemical Journal. Baltimore.
1879— Camb.P.S.; Camb.U.; Chem.S.; Dub.R.I.A.; Edinb.R.S.; Edinb.U.*i.*; Glasg.P.S.; N.H.M.; Oxon.R.; Pharm.S.*i.*; P.O.; R.S.; S.K.

A. Mcrgr. ..... Annales de Micrographie, spécialement consacrées à la Bactériologie, aux Protophytes et aux Protozoaires. Paris.
1888—98. Glasg.P.S.*i.*; Glasg.U.; N.H.M.; Oxon.R.

Am. C. S. J. ..... The Journal of the American Chemical Society. New York, Easton, Pa.
1879— B.M.; Camb.P.S.; Chem.S.; Edinb.U.*i.*; Glasg.U.*i.*; N.H.M.; Pharm.S.; P.O.; S.K.; U.C.L.*i.*

Am. Eng. & Railroad J. American Engineer and Railroad Journal. New York.
1893— [*Continuation of:* The Railroad and Engineering Journal, 1887—92.] B.M.; I.CE.; P.O.

Amici G. Tosc. ..... Giornale Toscano di Scienze Mediche, Fisiche, e Naturali; Amici, Bufalini, etc. Pisa.
1840—43. B.M.; Camb.U.*i.*; Glasg.P.S.*i.*; Oxon.B.

Amiens Ac. Mm. .....
Amiens Mm. .....
Amiens Mm. Ac. .....
Amiens Mm. Ac. Sc. ... Mémoires de l'Académie des Sciences, Agriculture, Commerce, Belles-Lettres, et Arts du département de la Somme. Amiens.
1835— B.M.; Camb.U.; Dub.T.C.*i.*; N.H.M.*i.*; Oxon.B.*i.*; R.S.*i.*

Am. I. Mn. E. T. ..... Transactions of the American Institute of Mining Engineers. Philadelphia, Easton, New York.
1871— Geol.S.; I.CE.; P.O.; S.K.

A. Mines ..... Annales des Mines, ou Recueil des Mémoires sur l'exploitation des Mines, et sur les Sciences et les Arts qui s'y rapportent. Paris.
1817— [*Continuation of:* Journal des Mines, etc., 1794—1815.] B.M.; Camb.U.; Chem.S.*i.*; Dub.R.I.A.; Edinb.R.S.; Edinb.U.*i.*; Geol.S.; Glasg.P.S.*i.*; Glasg.U.*i.*; I.CE.; N.H.M.; Oxon.B.(R.); P.O.; R.S.; S.K.

Am. I. T. ..... [Reports and Transactions] of the American Institute of the City of New York. Albany.
1841— B.M.*i.*; I.CE.*i*; P.O.*i.*; R.S.*i.*

Am. J. Md. Sc. ..... American Journal of the Medical Sciences. Philadelphia.
1827— B.M.; Edinb.U.*i.*; Glasg.P.S.*i.*; Glasg.U.; Oxon.R.; R.C.Surg.; U.C.L.*i.*

Am. J. Mth. ..... American Journal of Mathematics. Baltimore.
1878— B.M.; Camb.P.S.; Camb.U.; Dub.N.L.I.; Dub.R.I.A.;

Dub.T.C.; Edinb.R.S.; Edinb.U.; Glasg.U.*i.*; I.CE.*i.*; Math.S.; Oxon.B.; Oxon.R.; R.A.S.; R.S.; S.K.; U.C.L.

Am. J. Ot. ..... The American Journal of Otology. New York.
1879—82. Glasg.P.S.*i.*; R.S.

Am. J. Phm. ..... American Journal of Pharmacy; published by the Philadelphia College of Pharmacy. Philadelphia.
1836— [*Continuation of:* Journal of the Philadelphia College of Pharmacy, 1830—35.] Chem.S.*i.*; Pharm.S.; P.O.*i.*; R.C.Surg.*i.*

Am. J. Psychol. ..... The American Journal of Psychology. Baltimore, Worcester, Mass.
1888— B.M.; Edinb.U.; Oxon.B.; Oxon.R.; U.C.L.*i.*

Am. J. Sc. ..... The American Journal of Science and Arts; Silliman. New Haven.
1818— B.M.; Camb.P.S.*i.*; Camb.U.; Chem.S.*i.*; Dub.N.L.I.*i.*; Dub.R.C.S.*i.*; Dub.T.C.*i.*; Edinb.R.S.; Edinb.U.; Geol.M.; Geol.S.; Glasg.P.S.; Glasg.U.*i.*; I.CE.*i.*; N.H.M.; Oxon.B.; Oxon.R.; P.O.; R.A.S.*i.*; R.C.Surg.; R.Geogr.S.*i.*; R.S.; S.K.
See **Silliman J.**

Am. Mcr. J. ..... The American Monthly Microscopical Journal. New York.
1880— Camb.U.; Dub.N.L.I.; N.H.M.; Oxon.R.; Pharm.S.*i.*; P.O.

Am. Mcr. S. P. ..... Proceedings of the American Microscopical Society. Washington, Ithaca, N.Y.
1892—94. [*Continuation of:* Proceedings of the American Society of Microscopists, 1878—91.] [*Continued as:* Transactions of the American Microscopical Society, 1895—.] Linn.S.; N.H.M.

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— — — —. *Retgers, J. W.* Z. Ps. C. 3 (1889) 289-; 4 (1889) 189-; 11 (1893) 328-.
Seeds. *Wolffenstein, O.* (XII) J. Lndw. 23 (1875) 401-.
Soluble substances. *Del Lupo, M.* (XII) Rv. Sc.-Ind. 13 (1881) 161-.
— —, new method for. *Zehnder, L.* A. Ps. C. 29 (1886) 249-.
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—. *Raikow, P.* C. Ztg. 12 (1888) 525.
—. *Muraközy, K.* [1890] Föl. Közl. 21 (1891) 117-, 148-.
—, modified, application. *Kalecsinszky, S.* [1890] Föl. Közl. 21 (1891) 109-, 142-.
—, new. *Tschaplowitz [Chaplovits], F.* Fresenius Z. 18 (1879) 440-.
—, —. *Paalzow, C. A.* A. Ps. C. 13 (1881) 332-; 14 (1881) 176.
—, —. *Muraközy, K.* Termt. Közl. 25 (1893) (*Suppl.*) 33-.
—, —. *Myers, J. E.* [1893] L. Ps. S. P. 12 (1894) 372-; Ph. Mg. 36 (1893) 195-.
—, —. *Oberbeck, A.* A. Ps. C. 67 (1899) 209-.
— for powders. *Schumann, C.* C. Ztg. 8 (1884) 1778-.
—, simple form. *Linebarger, C. E.* Am. C. S. J. 21 (1899) 435-.
— and weighing apparatus, description. *Ångström, K.* Stockh. Öfv. (1895) 643-; Fschr. Ps. (1895) (*Ab.* 1) 24-.
Volumenometers, new. *Baumhauer, E. H. von.* Arch. Néerl. 3 (1868) 385-.
Wood. *Anon.* (VI 1239) Tilloch Ph. Mg. 57 (1821) 366-.
Yttrium, zirconium and erbium. *Meyer, S.* Wien Ak. Sb. 108 (1899) (*Ab.* 2*a*) 767-; Mh. C. (1899) 793-.

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Hare, R. Silliman J. 11 (1826) 121-.
Apparatus. *Nicol, W. W. J.* C. N. 47 (1883) 85-.
—. *Raikow, P., & Prodanow, N.* C. Ztg. 10 (1886) 1556.
Areopyknometer with arbitrary scale. *Piccini, A.* (XII) Rv. Sc.-Ind. 11 (1879) 14-.
Densimeter for solids and liquids. *Courtonne, H.* J. de Ps. 5 (1896) 315-.
— — — — —, new. *Pâquet, E.* Par. S. C. Bll. 24 (1875) 51-.
— — — — —, —. *Machado, V.* Lisb. J. Sc. Mth. 6 (1878) 285-.
Formula for density. *Almeida, C. A. M. de.* [1879] Lisb. J. Sc. Mth. 7 (1880) 20-.
Gravimeter for solids and liquids. *Guyton de Morveau, L. B.* Nicholson J. 1 (1797) 110-.
Hydrometer for solids and liquids. *Atkins, G.* Tilloch Ph. Mg. 31 (1808) 254-.
— — — — —. *Biervliet, — van.* Brux. S. Sc. A. 14 (1890) (*Pt.* 1) 60-.
Hydrostatic weighings. *Lummer, O.* Berl. Ps. Gs. Vh. (1887) 65 (*bis*)-.
— —, capillary influence. *Macé de Lépinay, J.* J. de Ps. 5 (1896) 266-.
— —, difficulty. *Macé de Lépinay, J.* J. de Ps. 5 (1886) 416-.
Ice and sea-water, density and volumes. *Ashe, W. A.* Science 10 (1887) 24.
Instrument, new. *Nicholson, W.* [1785] Manch. Ph. S. Mm. 2 (1789) 386-.
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Pendulum, application. *Serra-Carpi, G.* C. R. 64 (1867) 659-.
Pyknometer for volume and density of solids and liquids. *Bensemann, R.* Rpm. Anal. C. 7 (1887) 19-.
Volumenometer for solids and liquids. *Kopp, H.* Lieb. A. 35 (1840) 17-.

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Couerbe, J. P. Bordeaux Act. (1840) 5-.
Sainte-Claire Deville, [É.] H. C. R. 56 (1863) 729-.
Pfaundler, L. Innsb. Nt. Md. B. 1 (1870) 40-.
Croullebois, M. C. R. 78 (1874) 496-.
(Croullebois.) *Sainte-Claire Deville, É. H.* C. R. 78 (1874) 534-.
(Saint-Claire Deville.) *Croullebois, M.* C. R. 78 (1874) 805-.
Brühl, J. W. Berl. B. 9 (1876) 1368-.
Hautefeuille, —, & Troost, —. C. R. 83 (1876) 220-.
Ciamician, G. L., & Goldschmiedt, G. Wien Ak. Sb. 75 (1877) (*Ab.* 2) 431-.
Meyer, V. Berl. B. 10 (1877) 2068-; 11 (1878) 1867-.
Sainte-Claire Deville, É. H. C. R. 84 (1877) 1256-.
(Sainte-Claire Deville.) *Wurtz, C. A.* C. R. 84 (1877) 1347-.
Hofmann, A. W. Berl. B. 11 (1878) 1684-.
Troost, L. J. C. R. 86 (1878) 331-, 1394-.
Piccard, J. Berl. B. 13 (1880) 1079-.
Dewar, J., & Scott, A. B. A. Rp. (1881) 597.
Meyer, V. Berl. B. 15 (1882) 2775-.
Pawlewski, B. (XII) Kosmos (Lw.) 8 (1883) 93-; (X) Berl. B. 16 (1883) 1293-.
Meyer, V. Berl. B. 19 (1886) 1861-.
Nilson, L. F., & Pettersson, O. A. C. 9 (1886) 554-.
Schall, C. Berl. B. 20 (1887) 1435-, 1759-; 21 (1888) 100-.
Bott, W. C. S. P. 4 (1888) 110.

Richards, T. W. C. N. 59 (1889) 87–.
Krause, A., & Meyer, V. Z. Ps. C. 6 (1890) 5–.
Schall, C. Berl. B. 23 (1890) 919–, 1701–.
Lunge, G., & Neuberg, O. Berl. B. 24 (1891) 729–.
Schall, C. J. Pr. C. 50 (1894) 87–.
Winkler, L. W. C. Ztg. 23 (1899) 627.
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apparatus. *Grabowski, A.* A. C. Phm. 138 (1866) 174–.
— (in barometric vacuum). *Hofmann, A. W.* D. C. Gs. B. 1 (1868) 198–; 9 (1876) 1304–.
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—. *Dyson, G.* C. N. 55 (1887) 88.
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—. *Harker, J. A.* C. N. 62 (1890) 180.
— for determination by Gay-Lussac's method. *Warren, C. M.* [1866] Am. Ac. P. 7 (1868) 99–.
—, Grabowski's, modification. *Pfaundler, L.* D. C. Gs. B. 5 (1872) 575–.
—, Hofmann's, modification. *Wichelhaus, H.* D. C. Gs. B. 3 (1870) 166–.
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—, —, trough for. *Easterfield, T. H.* C. N. 60 (1889) 250–.
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— — —, of substances which attack mercury. *Pfaundler, L.* Berl. B. 12 (1879) 165–.
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—. *Brown, J. T.* B. A. Rp. (1879) 304–.
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— —. *Tilden, W. A.* C. N. 37 (1878) 219.
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— — — at very high temperatures. *Meyer, C., & Meyer, V.* Berl. B. 12 (1879) 1112–.
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— — —, apparatus for. *Eykman, J. F.* Berl. B. 22 (1889) 2754–.
— — — —, V. Meyer's method. *Hoff, J. H. van't, & Romeny, J.* (XII) Mbl. Nt. 8 (1878) 135–.
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— — — —, Lux's. *Anon.* C. N. 58 (1888) 4–.
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3210 Strain and stress. Stress-strain relations. Strain-energy. Æolotropy. Crystals.
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— and molecular mechanics. *Girard de Caudemberg*, —. Dijon Ac. Mm. (1830) 5–, (*livr.* 2) 3–.
—, received doctrines. *Tilloch, A.* [1799] Tilloch Ph. Mg. 8 (1800) 70–, 119–, 211–.
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electric, for low temperatures. *Witkowski, A.* Krk. Ak. (*Mt.-Prz.*) Rz. 3 (1891) 380–; Crc. Ac. Sc. Bll. (1891) 188–.
—, — — —. *Rr.* Dingler 304 (1897) 57–.
—, in medicine. *Guérout, A.* Lum. Élect. 4 (*1881) 153–.
—, modification. *Mascart, É.* J. de Ps. 2 (1873) 313–.
—, registering. *Morin, A. J.* C. R. 64 (1867) 327–.
— resistance-. *Siemens, C. W.* (VI *Adds.*) Ph. Mg. 21 (1861) 73–.
— —. *Shaw, W. N.* B. A. Rp. (1888) 590–.
platinum. *Griffiths, E. H.* [1890] Phil. Trans. (A) 182 (1892) 43–.
—. *Wade, E. B. H.* Camb. Ph. S. P. 9 (1898) 526–.
—. *Chappuis, —.* Par. Poids et Mes. PV. (1899) 157–.
—, construction. *Callendar, H. L.* Ph. Mg. 32 (1891) 104–.
—, direct reading. *Clark, G. M.* B. A. Rp. (1894) 758.
—, — —. *Appleyard, R.* [1895] L. Ps. S. P. 14 (1896) 74–; Ph. Mg. 41 (1896) 62–.
—, for low temperatures. *Griffiths, E. H., & Clark, G. M.* [1892] Camb. Ph. S. P. 8 (1895) 2–.
—, standardising. *Callendar, H. L., & Griffiths, E. H.* [1890] Phil. Trans. (A) 182 (1892) 119–.
quick-indicating. *Genglaire, E.* Lum. Élect. 46 (1892) 372–.

Thermomultiplier. *Nobili, L.* Bb. Un. 44 (1830) 225–.
Thermophone. *Whipple, G. C.* Science 2 (1895) 639–.
—. *Whipple, G. C., & Warren, H. E.* [1899] Sc. Abs. 3 (1900) 69.
Thermopile, differential. *Beaulieu-Marconnay, K. (Frhr.) von.* Humb. 5 (1886) 224–.
—, new. *Rubens, H.* Z. Instk. 18 (1898) 65–, 137.
—, — (Rubens). *Czermak, P.* Z. Instk. 18 (1898) 135–.
Thermoscope, electric. *Ascoli, M.* Rm. R. Ac. Linc. Rd. 6 (1890) (*Sem.* 1) 449–.
—, —, differential. *Nosworthy, W. F.* Tel. J. 11 (1882) 167–.

1240 Temperature Measurement by Calorimeter, Vapour Density, Transpiration, Viscosity, etc.

Air-calorimeter. *Gezekhus, N. A.* [1882] (XII) Rs. Ps.-C. S. J. 15 (*Ps., Pt.* 1) (1883) 10–.
Calorimetric methods. *Arsonval, A. d'.* Lum. Élect. 13 (1884) 361–, 405–, 445–, 493–.
Evaporation of carbon-tetrachloride. *Müller-Erzbach, W.* D. Nf. Vh. (1894) (*Th.* 2, *Hälfte* 1) 72–.

Evaporation as means of measuring temperature. *Müller-Erzbach, W.* Exner Rpm. 24 (1888) 575–; Met. Z. 5 (1888) 453–; Z. Instk. 10 (1890) 88–.

Furnace temperature, determination. *Beaunier, —, & Gallois, —.* J. Mines 12 (1801) 272–; 16 (1804) 37–, 81–, 193–.

— —, —. *Appolt, —.* Berg- Hm. Ztg. 15 (1856) 165–.

Gases, temperature measurements by refractivity. *Berthelot, D.* Par. Ms. H. Nt. Bll. 4 (1898) 301–.

High temperatures, measurement. *Wilson, John.* ME. I. P. (1852) 53–.

— —, — (Wilson's method). *Kohlmann, —.* Halle Z. Nw. 2 (1853) 115–.

— —, —. *Beutel, E.* Wien Az. 36 (1899) 261.

— —, —. *Berthelot, D.* Par. S. C. Bll. 23 (1900) 322–.

— —, — by meldometer. *Ramsay, W., & Eumorfopoulos, N.* L. Ps. S. P. 14 (1896) 105–; Ph. Mg. 41 (1896) 360–.

— —, — — Weinhold's calorimeter. *Schneider, C. H.* Carl Rpm. 11 (1875) 116–.

Hydropyrometer for metallurgists' use. *Andrée, S. A.* Jern-Kont. A. 39 (1884) 173–; Berg- Hm. Ztg. 43 (1884) 506–.

Lava from Etna, temperature. *Bartoli, A.* Catania Ac. Gioen. At. 3 (1891) 61–; Catania Ac. Gioen. Bll. 29 (1892) 2–; Mil. I. Lomb. Rd. 29 (1896) 363–.

Modern calorimeters and their use. *Struthers, J.* Sch. Mines Q. N.Y. 16 (1895) 201–.

Pyrometer. *Mensching, J., & Meyer, V.* Gött. Nr. (1887) 128–.

—, acoustic. *Cagniard-Latour, C., & Demonferrand, F.* C. R. 4 (1837) 28–.

—, —. *Mayer, A. M.* Am. J. Sc. 4 (1872) 427–.

—, —. *Chautard, J.* J. de Ps. 3 (1874) 78–; C. R. 78 (1874) 128–.

—, —. *Sanford, F.* Ps. Rv. 1 (1894) 140–.

—, calorimetric. *Byström, O.* Stockh. Öfv. 19 (1862) 159–.

—, —. *Salleron, J.* Les Mondes 37 (1875) 500–.

—, micrometric. *C., H. T.* QJ. Sc. 6 (1819) 230–.

—, platinum. *Hoadley, J. C.* Franklin I. J. 84 (1882) 91–.

—, — -water. *Hoadley, J. C.* Franklin I. J. 84 (1882) 169–, 252–.

—, steam. *Johnson, W. R.* Silliman J. 22 (1832) 96–.

—, water-circulation. *Amagat, E. H.* C. R. 97 (1883) 1053–.

Pyrometric bricks of clay, effect of prolonged exposure to heat. *Guyton de Morveau, L. B.* A. C. 78 (1811) 73–.

— cylinders, Wedgwood's, manufacture. *Gazeran, —.* A. C. 36 (1800) 100–.

Thermometer, acoustic. *Preston, S. T.* Ph. Mg. 32 (1891) 58–.

—, —. *Quincke, G.* A. Ps. C. 63 (1897) 66–.

—, —. *Anon.* Rv. Sc.-Ind. 31 (1899) 30–.

—, —. *Anon.* Rv. Sc.-Ind. 31 (1899) 68–.

—, aspiration. *Fuchs, P.* Z. Instk. 18 (1898) 337–.

Thermometer, electro-capillary. *Debrun, E.* C. R. 89 (1879) 755.

—, float-. *Fuchs, K.* Exner Rpm. 27 (1891) 118–.

Thermophone, for measurement of high temperatures. *Wiborgh, J.* [1896] Jern-Kont. A. 51 (1897) 102–; Berg- Hm. Ztg. 55 (1896) 247–.

—, Wiborgh's. *Jüptner, H. (Frhr.) von.* Oestr. Z. Brgw. 45 (1897) 99–.

Thermoscope, differential viscosity. *Thomson, (Sir) W.* Edinb. R. S. P. 10 (1880) 537.

—, new. *Baur, C.* (XII) Berl. Ps. Gs. Vh. 1 (1882) 47–.

—, —. *Coleman, J. J.* Glasg. Ph. S. P. 15 (1884) 94–.

—, — principle. *Leroux, F. P.* L'I. 29 (1861) 6–.

—, thermomagnetic. *Thomson, (Sir) W.* Edinb. R. S. P. 10 (1880) 538–.

Transition temperatures as fixed points in thermometry. *Meyerhoffer, W., & Saunders, A. P.* Z. Ps. C. 27 (1898) 367–.

— — — — — — —. *Richards, T. W., & Churchill, J. B.* Z. Ps. C. 28 (1899) 313–.

Viscosity of gases at high temperatures. *Barus, C.* Am. J. Sc. 35 (1888) 407–.

Water vapour pressure, measurement by. *Shaw, W. N.* [1883] Camb. Ph. S. T. 14 (*1889) 30–.

1250 Special Thermometers (Maximum, Minimum, Self-recording, etc.).

(*See also* **Meteorology 0250.**)

Furnace temperature, autographic record. *Roberts-Austen, —.* I. & S. I. J. (1892) (*No.* 2) 33–.

Microthermometer. *Laroque, F.* C. R. 97 (1883) 1207–.

Pyrometers. *Fourmy, —.* J. Mines 14 (1803) 423–; 28 (1810) 427–.

—. *Miller, A.* Edinb. N. Ph. J. 44 (1848) 126–.

—. *Decharme, C. J.* [1877] (XII) M.-et-L. S. Ac. Mm. 34 (1878) 112–.

—, differential, water circulation. *Knab, L.* Gén. Civ. 16 (1889–90) 327–.

—, hot blast, Krupp's. *Bergen, A. von.* I. & S. I. J. (1886) 207–.

—, registering. *Daniell, J. F.* Phil. Trans. (1830) 257–; (1831) 443–.

—, —. *Bristol, W. H.* [1900] Sc. Abs. 4 (1901) 294.

—, — heat developed in lightning discharge. *Raasche, G.* Riga Cor.-Bl. 38 (1895) 91.

Pyrometry at high temperatures by water circulation. *Lauth, C., & Vogt, G.* [1886] Gén. Civ. 10 (1886–87) 78–.

Pyroscope of fire-station on St. Peter's tower in Munich. *Steinheil, C. [A.] von.* Münch. Ab. 3 (1837–43) 561–.

Pyroscopes. *Ledieu, A. C. H.* C. R. 94 (1882) 1274–.

Thermograph, Hough's. *Grugan, F. C.* [U.S.] Chief Sig. Off. A. Rp. (*1877) 510–.

THERMOMETERS.

alarm or signalling. *Morin, J.* C. R. 59 (1864) 1082.
— — —. *Palmieri, L.* (x) Nap. Rd. 12 (1873) 59–.
— — —. *Barillé, —.* C. R. 118 (1894) 246–.
— — —. *Cochius, F.* C. Ztg. 19 (1895) 1733.
— — —, to indicate presence of icebergs. *Michel, R. F.* C. R. 78 (1874) 1066–.
baroscopic. *F.* Gén. Civ. 18 (1890–91) 308–.
black-bulb *in vacuo*. *Busoni, D.* (IX) Ven. Aten. At. 3 (1866) 529–.
— — — —. *Wilson, J. M.* Ph. Mg. 31 (1866) 104–, 261–.
— — — — (Wilson). *Tyndall, J.* Ph. Mg. 31 (1866) 191–.
— — — —. *Vernon, G. V.* Manch. Lt. Ph. S. P. 11 (1872) 129–.
— — — —. *Hicks, J. J.* [1874] Met. S. QJ. 2 (1875) 99–.
— — — —. *McLeod, H.* B. A. Rp. (1889) 505–.
calorimetric, delicate. *Pickering, S. U.* L. Ps. S. P. 8 (1887) 8–; Ph. Mg. 21 (1886) 330–; L. Ps. S. P. 8 (1887) 229–; Ph. Mg. 23 (1887) 401–.
—, Pickering's. *Wegscheider, R.* Z. Instk. 6 (1886) 266–.
contact. *Fourier, J. B. J.* A. C. 37 (1828) 291–.
deep sea (Six's). *Aboville, —.* J. Mines 9 (1798–99) 75–.
— —. *Dietrichson, J. L. W.* A. Ps. C. 148 (1873) 298–.
— —. *Jones, J. R.* R. S. P. 24 (1876) 321–.
— —. *Chabaud, V.* C. R. 114 (1892) 65–.
— —. *Biétrix, E.* Par. S. Phlm. Bll. 6 (1894) 59–.
— —, tests. *Thoulet, J.* Rv. Mar. et Col. 122 (1894) 204–.
— —, electrical. *Siemens, (Sir) C. W.* [1882] R. S. P. 34 (1883) 89–.
— —, —, Siemens's. *Bartlett, J. R.* [1882] Am. As. P. 31 (1883) 221–.
differential (Leslie's). *De Butts, E.* [1814] Am. Ph. S. T. 1 (1818) 301–.
—. *Howard, W.* QJ. Sc. 8 (1820) 219–.
—. *Ritchie, W.* [1826] Phil. Trans. (1827) 129–.
— (Leslie's). *B., D.* Gleanings Sc. 2 (1830) 23–.
—. *Kemp, K. T.* Edinb. J. Nt. Gg. Sc. 1 (1830) 262–.
—. *Hall, M.* Ph. Mg. 8 (1836) 56–.
—. *Walferdin, H.* C. R. 14 (1842) 63–.
—. *Dupré, Anat.* As. Fr. C. R. 4 (1875) 420–.
—. *Dufour, H.* [1879–83] Laus. S. Vd. Bll. 16 (1880) 655–; J. de Ps. 2 (1883) 321–.
— air. *Brough, J. C.* Phm. J. 10 (1869) 214–.
— —. *Pfaundler, L.* [1875] Wien Ak. Sb. 72 (1876) (*Ab.* 2) 729–.
— mercury. *Mendelejeff, D. I.* Berl. B. 8 (1875) 539–.
distance-. *Wheatstone, (Sir) C.* B. A. Rp. 37 (1867) (*Sect.*) 11–.
distance-. *Ferrini, R.* Mil. I. Lomb. Rd. 15 (1882) 44–.
—. *Luvini, G.* (XII) Rv. Sc.-Ind. 14 (1882) 177–.
—. *Becker, A.* Magdeb. Nt. Vr. Jbr. u. Ab. (1889) 32–.
—. *Moennich, P.* Z. Instk. 9 (1889) 122–.
—. *Puluj, J.* Wien Ak. Sb. 98 (1890) (*Ab.* 2*a*) 1502–.
—, for hot chamber. *Grosheintz, H.* [1886] Mulhouse S. In. Bll. 57 (1887) 97–.
—, of Morin and Barthélemy. *Meylan, E.* Lum. Élect. 32 (1889) 511–.
house-, in form of watch. *Steinhauser, A.* Carl Rpm. 12 (1876) 388–.
hypsometric. *Walferdin, H.* C. R. 17 (1843) 904–.
to indicate mean temperatures. *Jürgensen, J.* C. R. 3 (1836) 143–.
for lecture purposes. *Bickerton, A. W.* N. Z. I. T. 7 (1874) 152–.
marine. *Jamieson, R.* Tilloch Ph. Mg. 57 (1821) 294–.
maximum. *Magnus, G.* Pogg. A. 22 (1831) 136–.
—. *Walferdin, H.* Par. S. Gl. Bll. 7 (1835–36) 193–; C. R. 40 (1855) 951–.
—. *Grüel, C. A.* Dingler 155 (1860) 192–.
—. *Geissler, H.* A. Ps. C. 123 (1864) 657–.
— and minimum. *Keith, A.* [1795] Edinb. R. S. T. 4 (1798) 203–.
— — —. *Lemaistre, L. F.* J. Mines 7 (1798) 473–.
— — —. *Gay-Lussac, L. J.* A. C. 3 (1816) 90–.
— — —. *Landriani, M.* Brugnatelli G. 1 (1818) 413–.
— — —. *MacVicar, J. G.* C. S. J. 10 (1858) 221–; 11 (1859) 106.
— — —. *Symons, W.* C. S. J. 15 (1862) 299–.
— — —. *Govi, G.* [1864] Tor. Lav. Sc. Fis. Mt. (1869) 5–.
— — —. *Codazza, G.* Tor. At. Ac. Sc. 5 (1869–70) 711–.
— — —. *Denton, S. G.* [1874] Met. S. QJ. 2 (1875) 193–.
— — —. *Duclaux, É.* J. de Ps. 5 (1876) 13–.
— — —. *Kappeller, H.* Wien Met. Z. 18 (1883) 225–; Moncalieri Oss. Bll. 3 (*1883) 87–.
— — —, coloured liquids for filling. *Lüdersdorff, F.* Dingler 118 (1850) 360–.
— — —, gas-. *Gar, A.* (VI *Adds.*) N. Cim. 18 (1863) 238–.
— — —, Hicks's. *Stewart, B.* R. S. P. 10 (1859–60) 312–.
— — —, metallic (Hermann and Pfister's). *Hirsch, A.* [1868] Neuch. Bll. 8 (1870) 221–.
— — —, —, portable. *Jürgensen, L. U.* As. Nr. 14 (1837) 173–.
— — —, registering. *Hall, M.* QJ. Sc. 4 (1818) 43–.
— — —, —. *Delta* (Δ). Edinb. J. Sc. 10 (1829) 159–.

maximum and minimum, registering. *Lallemand, A.* C. R. 66 (1868) 812–.
— — —, —. *Macdougall, W.* Sc. Met. S. J. 3 (1873) 78–.
— — —, —. *Trouillet, (le capit.)* —. [1885] Doubs S. Mm. 10 (1886) 54–.
— — —, —, application of capillary phenomena. *Barbier, É.* (VI *Adds.*) Par. A. Obs. 7 (1863) 368–.
— — —, —, Bertoni's. *Serpieri, A.* Rm. Cor. Sc. 3 (1855) 14–.
— — —, —, Marchi's. *Marangoni, C.* N. Cim. 27 (*1868) 318–.
— — —, —, relative merits of types. *Draper, D.* U. S. Weath. Bur. Bll. 11 (1894) 710–.
—, new. *Monaco, E.* Moncalieri Oss. Bll. 13 (1893) 12.
—, registering. *King, J.* Edinb. J. Sc. 9 (1828) 113–.
—, — (King's). *Delta* (Δ). Edinb. J. Sc. 9 (1828) 300–.
—, —. *Phillips, J.* B. A. Rp. (1832) 574–; (1856) (*pt.* 2) 41.
—, —, compensation. *Scott, W. L.* C. N. 1 (1860) 98–.
mercurial, electrically read at a distance. *Brown, H. T.* Nt. 23 (1881) 464–.
metastatic maximum, new. *Walferdin, H.* C. R. 46 (1858) 737–.
— mercurial, as maximum thermometer. *Walferdin, H.* C. R. 38 (1854) 770–.
minimum. *Walferdin, H.* Par. S. Gl. Bll. 7 (1835–36) 354–.
—, alcohol. *Pastorelli, F.* Br. Met. S. P. 4 (1869) 264–.
—, Rutherford's, modifications. *Walferdin, H.* C. R. 40 (1855) 899–.
—, —, new form. *Whipple, G. M.* B. A. Rp. 43 (1873) (*Sect.*) 50.
mining. *Birkner, —.* Jb. Berg- Hw. (1898) 108–.
for physiological purposes. *Marey, É. J.* C. R. 92 (1881) 1441–.
platinum, for freezing points of dilute solutions. *Griffiths, E. H.* Nt. 62 (1900) 563.
recording. *Harrison, M.* B. A. Rp. (1848) (*pt.* 2) 14–.
—. *Moberg, A.* [1859] (VIII) Helsingf. Öfv. 5 (1863) 58–.
—. *Lewis, J.* Am. As. P. (1860) 21–.
—. *Hamilton, G.* As. S. M. Not. 25 (1865) 29–.
—. *Zech, P.* Würtb. Jh. 25 (1869) 101–.
—. *Bouziat, —.* (XII) Fr. S. Ag. Mm. (1876) (2) 455–.
—. *Mallock, A.* B. A. Rp. (1882) 477–.
—. *Artimini, F.* Rv. Sc.-Ind. 18 (1886) 201–.
—. *Russell, H. C.* N. S. W. R. S. J. 22 (1889) 335–.
—, horary. *Veladini, G.* Mil. G. I. Lomb. 3 (1842) 19–; 2 (1850) 55–.
—, metallic. *Maurer, J.* (XII) Z. Instk. 3 (1883) 308–.
—, —, maximum and minimum. *Burq, V.* [1883] Par. S. Bl. Mm. 35 (*1884) (*C.R.*) 446–.
registering air-, construction. *Sprung, A.* U. S. Weath. Bur. Bll. 11 (1894) 718–.
—, for hot springs. *Guzzanti, C.* Rass. Sc. Gl. It. 2 (1892) 308–.
Sikes', improvement. *Adie, Rich.* Edinb. N. Ph. J. 54 (1853) 84–.
unaffected by radiation. *Joule, J. P.* [1867] Manch. Lt. Ph. S. P. 7 (1868) 35–.
with variable mercury filling. *Grützmacher, F.* Z. Instk. 16 (1896) 171–, 200–.

Thermometric instrument. *Bellani, A.* (VI *Adds.*) Majocchi A. Fis. C. 14 (1844) 62–.
— sunshine recorder, U. S. Weather Bureau. *Marvin, C. F.* U. S. Weath. Bur. Rp. (1893) 17–.
Thermoscope. *Rumford, B.* (*Count*) Par. Mm. de l'I. 6 (1806) 71–.

1255 Radiation Thermometry, Optical Pyrometry, etc.

"Absolute black" bodies, electrically heated. *Lummer, O., & Kurlbaum, F.* Berl. Ps. Gs. Vh. (1898) 106–.
Colour, relation to temperature. *Decharme, C.* (XII) M.-et-L. S. Ac. Mm. 32 (1875) 102–.
—, — — —. *Howe, H. M.* Rv. Un. Mines 49 (1900) 200–.
—, — — — (heated steel). *White, M., & Taylor, F. W.* [1899] Sc. Abs. 3 (1900) 243.
— thermoscope. *Rebenstorff, H. A.* Dresden Isis Sb. (1896) 31–.
Compensation pyrheliometer, radiation measurement by. *Ångström, K.* A. Ps. C. 67 (1899) 633–.

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Nichols, E. L. Am. J. Sc. 19 (1880) 42–.
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(Becquerel.) *Le Chatelier, H.* C. R. 114 (1892) 340–.
(Le Chatelier.) *Becquerel, H.* C. R. 114 (1892) 390–.
Violle, J. C. R. 114 (1892) 734–.
Crova, A. C. R. 114 (1892) 941–.
Berthelot, D. Par. S. Ps. Sé. (1895) 135–; C. R. 120 (1895) 831–; 126 (1898) 410–.
Pyrometer. *St., H.* Oestr. Z. Brgw. 37 (1889) 326.
— (Mesuré and Nouel's). *Ernst, C.* Oestr. Z. Brgw. 38 (1890) 533–.
— (— — —). *Struthers, J.* Sch. Mines Q. N. Y. 12 (1891) 292–.
—. *Thwaite, B. H.* I. & S. I. J. (1892) (*No.* 1) 183–.
Pyrometers. *Salomon, —.* Z. Angew. C. (1891) 440.
Red heat and "grey" heat. *Lummer, O.* Berl. Ps. Gs. Vh. (1897) 121–.
Refrangibility of emitted light, measurement by. *Dewar, J.* B. A. Rp. 43 (1873) 461–.

Refrangibility of emitted light, measurement by. *Crova, A.* C. R. 87 (1878) 979–; J. de Ps. 8 (1879) 196–; C. R. 90 (1880) 252–.
Rotatory polarisation, measurement by (Mesuré and Nouel's method). *Evrard, A.* Gén. Civ. 13 (1888) 43–.

1260 Comparison of Thermometers. Thermometric Scales. Reduction to Thermodynamic Scale. (*See also* Thermodynamics, 2400, etc.)

Absolute temperature. *Schreber, K.* N.-Vorp. Mt. 29 (1898) 45–.
— —, dimensions. *Burton, C. V.* Ph. Mg. 24 (1887) 96–.
— —, —. *Abraham, H.* Lum. Elect. 51 (1894) 66–.
— — and low temperature. *Gleue, —.* [1899] Lüneb. Nt. Vr. Jh. 15 (1901) xvii–.
— zero of heat. *Dalton, J.* Nicholson J. 5 (1803) 34–.
— — — —. *Benzenberg, J. F.* Gilbert A. 61 (1819) 363–.
— — — —. *Clément, —, & Désormes, —.* J. de Ps. 89 (1819) 428–.
— — — —. *Veĭnberg* [*Weinberg*], *Y. I.* [1868] (xii) Mosc. S. Sc. Bll. 8 (*No.* 3) (1870) 7–.
— — — —. *Koppe, C.* A. Ps. C. 151 (1874) 642–.
— — — —. *Klein, J. F.* V. Nost. Eng. Mg. 22 (1880) 279–.
— — — perfect gas-thermometer. *Rankine, W. J. M.* Edinb. R. S. T. 20 (1853) 561–.
Calibration. *Walferdin, H.* C. R. 17 (1843) 1195.
—. *Krüger, A.* [1872] Helsingf. Öfv. 15 (1873) 52–.
— (Krüger). *Argelander, F. W. A.* [1873] Helsingf. Öfv. 16 (1874) 43–.
—. *Lermantov, V. V.* (xii) Rs. C. Ps. S. J. 10 (*Ps.*) (1878) [(*Pt.* 1)] 244–.
—. *Thiesen, M.* Carl Rpm. 15 (1879) 285–, 677–.
—. *Broch, O. J.* Par. Poids et Mes. Tr. Mm. 5 (1886) 82 pp.
—. *Offret, A.* Fr. S. Mn. Bll. 13 (1890) 405–.
—. *Pernet, J., Jaeger, W., & Gumlich, E.* Berl. Ps. Reichsanst. Ab. 1 (1894) 39–.
—. *Hulett, G. A.* Z. Ps. C. 33 (1900) 237–.
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— (below 0°C.). *Martinetti, M.* Tor. Ac. Sc. At. 25 (1890) 827–.
—. *Bartoli, A., & Stracciati, E.* Catania Ac. Gioen. Bll. 18–19 (1891) 25–.
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— (0° to 32°). *Bartoli, A., & Stracciati, E.* Catania Ac. Gioen. At. 4 (1892) *Mem.* 7, 96 pp.
— (— — —) (Bartoli and Stracciati). *Lungo, C. del.* Catania Ac. Gioen. At. 6 (1893) *Mem.* 1, 3 pp.
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—, uncertainty. *Weber, W. E.* Pogg. A. 18 (1830) 608–.
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—. *Hess, H.* [1848] St. Pét. Ac. Sc. Bll. 9 (1851) 81–.
—. *Langlois, M.* C. R. 102 (1886) 1451–.
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—. *Potter, R.* Edinb. J. Sc. 6 (1832) 166–.
—. *Violle, J.* C. R. 85 (1877) 543–; 87 (1878) 981–; 89 (1879) 702–; J. de Ps. 7 (1878) 69–; 9 (1880) 81–.
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—. *Waterman, F. A.* Ps. Rv. 4 (1897) 161–.
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—, *quasi* isotropic. *Voigt, W.* Gött. Nr. (1893) 211–.
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—, specific heat and internal work. *Joubin, P.* J. de Ps. 9 (1890) 554–.
—, — — — magnetism, relations. *Hermann, R.* Mosc. S. Nt. Bll. 7 (1834) 315–.
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— — — and disgregation of a body. *Clausius, R.* Arch. Sc. Ps. Nt. 24 (1865) 117–.
— — — — — — — — (Clausius). *San Roberto, P. di.* Arch. Sc. Ps. Nt. 25 (1866) 34–.
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— — — — heat-content. *Robin, G.* [1879] Par. S. Phlm. Bll. 4 (1880) 8–.
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—, oxygen, carbon-dioxide and hydrogen. *Lummer, O., & Pringsheim, E.* [1898] A. Ps. C. 64 (1898) 555–; Smiths. Ct. 29 (1903) *Art.* VI, 29 pp.
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— — — and pressure. *Amagat, E. H.* C. R. 122 (1896) 66–; Par. S. Ps. Sé. (1896) 24–.

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— — —. *Moutier, J.* C. R. 71 (1870) 807–.
— — —. *Joly, J.* R. S. P. 45 (1889) 33–.
— — —. *Bickerton, —.* Aust. As. Rp. (1891) 117.
— — —, measurement. *Graf, J. H.* Bern Mt. (1880) 71–.
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— — —. *Stimpfl, G.* Dingler 290 (1893) 213–, 235–.
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measurement, new method. *Wiedemann, E. E. G.* Arch. Sc. Ps. Nt. 51 (1874) 73–; 56 (1876) 273; A. Ps. C. 157 (1876) 1–.
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— refractive power of gases, relation. *Avogadro, A.* [1817–26] Mod. Mm. S. It. 18 (1818) 154–; Tor. Mm. Ac. 33 (1829) 49–.
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—. *Wittwer, W. C.* Z. Mth. Ps. 24 (1879) 193–.
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—. *Kurz, A.* A. Ps. C. 151 (1874) 173–.
—. *Casalonga, D. A.* Par. Ing. Civ. Mm. (1878) 109–.
—. *Kurz, A.* Exner Rpm. 20 (1884) 161–.
—, carbon dioxide and hydrogen at constant volume. *Joly, J.* [1890] Phil. Trans. (A) 182 (1892) 73–.
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— — at constant volume. *Joly, J.* [1894] Phil. Trans. (A) 185 (1895) 943–.
— — — — —, as function of temperature. *Joly, J.* [1894] Phil. Trans. (A) 185 (1895) 961–.
— —, variation at high temperatures. *Valérius, H.* Brux. Ac. Bll. 48 (1879) 601–.
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(variation.) *Wiedemann, E. E. G.* A. Ps. C. 2 (1877) 195–.
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(saturated.) *Waals, J. D. van der.* Amst. Ak. Vs. M. 12 (1878) 169–; A. Ps. C. Beibl. 2 (1878) 328–.
(saturated.) *Bouty, E.* J. de Ps. 4 (1885) 28–.
Morera, G. Rm. R. Ac. Linc. Rd. 7 (1891) (*Sem.* 2) 119–.
(saturated.) *Mathias, E.* C. R. 119 (1894) 849–; Toul. Fac. Sc. A. 12 (1898) E, 17 pp.

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— (Naumann). *Kundt, A., & Warburg, E.* Berl. B. 8 (1875) 1514–.
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—, applied to steam engine theory. *Frank, A.* Hann. Archt.-Vr. Z. 37 (1891) 337–.
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Rabuteau, —. Par. S. Bl. Mm. 34 (*1882) (*C. R.*) 376–.
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— — and kinetic theory of gases. *Donnini, P.* N. Cim. 5 (1879) 97–.
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— — — gases. *Le Chatelier, H.* C. R. 104 (1887) 1780–.
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— — —, variation in heat. *Moutier, J.* [1877] Par. S. Phlm. Bll. 2 (1878) 68–.
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— — of freezing, and means of utilising. *Lecoq, H.* Auvergne A. Sc. 24 (1851) 432–.
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— — and sensible heat. *Vermehr, J. L. H. C.* Leijd. A. Ac. (1830–31) 42 pp.
— — of water below 0°, with remarks on formation of ice in sea. *Pettersson, O.* Stockh. Öfv. 35 (1878) *No.* 2, 53–; A. Ps. C. Beibl. 2 (1878) 399–.

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Formic and acetic acids, crystallisation. *Pettersson, O.* Stockh. Öfv. 35 (1878) *No.* 9, 17–.
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—. *Wartmann, É.* [1844] Laus. Bll. S. Vd. 1 (1842–45) 287–.
—. *Hess, H.* [1848] St. Pét. Ac. Sc. Bll. 9 (1851) 81–.
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—. *Jamin, J.* C. R. 70 (1870) 715–.
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—. *Zakrzewski, I.* [1892] Krk. Ak. (*Mt.-Prz.*) Rz. 4 (1893) 247–; A. Ps. C. 47 (1892) 155–.
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—, — — — — — (Renou). *Jamin, J.* C. R. 70 (1870) 969–.
Lead and tin and alloys. *Rudberg, F.* Stockh. Ak. Hndl. (1829) 157–; Pogg. A. 18 (1830) 240–; 19 (1830) 125–.

Mercury. *Person, C. C.* C. R. 25 (1847) 334–; A. C. 24 (1848) 257–.
—. *Langlois, M.* C. R. 103 (1886) 1009–.
Pig-iron and other metals. *Minary, —, & Résal, —.* A. Mines 19 (1861) 401–.
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Person, C. C. C. R. 17 (1843) 495–.
Andrews, T. [1847] C. S. J. 1 (1849) 27–.
Legrand, J. N. C. R. 42 (1856) 213–.
Groshans, J. A. Arch. Néerl. 5 (1870) 1–, 193–.
Moutier, J. Par. S. Phlm. Bll. 1 (1877) 17–; 4 (1880) 247–.
Puschl, K. [1880] Wien Ak. Sb. 82 (1881) (*Ab.* 2) 1102–.
Morris, C. J. Sc. 3 (1881) 584–, 640–.
Walter, A. [1881] A. Ps. C. 16 (1882) 500–.
Bouty, E. J. de Ps. 4 (1885) 26–.
Fuchs, K. Exner Rpm. 26 (1890) 345–.
Jäger, G. Wien Ak. Sb. 100 (1891) (*Ab.* 2*a*) 1122–.
Bakker, G. Z. Ps. C. 10 (1892) 558–.
Tsuruta, K. J. de Ps. 2 (1893) 272–.
Pagliani, S. N. Cim. 2 (1895) 312–.
Louguinine, W. A. C. 7 (1896) 251–.
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Groshans, J. A. A. Ps. C. 64 (1898) 778–.
Louguinine, W. A. C. 13 (1898) 289–.
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— — —, variation in heat. *Moutier, J.* [1877] Par. S. Phlm. Bll. 2 (1878) 68–.
Heat of gases and vapours. *Poisson, S. D.* A. C. 23 (1823) 337–.
— — vaporisation, and expansion. *Groshans, J. A.* A. Ps. C. 64 (1898) 789–.
— — —, influence of electrification. *Fontaine, É.* J. de Ps. 6 (1897) 16–.
— — — and internal condition. *Puschl, K.* Wien Ak. Sb. 75 (1877) (*Ab.* 2) 745–.
— — — — specific heat; and alcoholic engines. *Meikle, H.* Tilloch Ph. Mg. 68 (1826) 34–.
— — — — theory of elastic fluids. *Pouillet, C. S. M.* C. R. 24 (1847) 915–.
— — — — vapour density found by vapour calorimeter. *Allen, H. N.* [1890] Nebr. Un. Stud. 1 (1888–92) 195–.
— — — — — pressures. *Rodzevič, N. M.* Rs. Ps.-C. S. J. 30 (*Ps.*) (1898) 183–; J. de Ps. 9 (1900) 55–.
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—. *Le Chatelier, H.* Par. S. C. Bll. 47 (1887) 4, 289.
—. *Tumlirz, O.* Wien Ak. Sb. 101 (1892) (*Ab.* 2*a*) 184–.
Law, Van der Waals's. *Darzens, G.* C. R. 124 (1897) 610–.
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— at 0° C. by Bunsen's ice calorimeter. *Svensson, A.* Stockh. Öfv. (1895) 537–; Fschr. Ps. (1895) (*Ab.* 2) 398.
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— — — physical properties. *Aubel, E. van.* J. de Ps. 5 (1896) 70–.
— — pressure. *Clausius, R.* Pogg. A. 82 (1851) 274–.
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— — — and pressure. *Ure, Andr.* Phil. Trans. (1818) 338–.
— — — — — (Ure). *Tredgold, T.* Tilloch Ph. Mg. 66 (1825) 277.
— — — — —. *Linebarger, C. E.* Am. J. Sc. 49 (1895) 380–.
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—. *Hartog, P. J., & Harker, J. A.* [1893] Nt. 49 (1893-94) 5.
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— from saturated salt solutions. *Trouton, F. T.* [1899] Ir. Ac. T. 31 (1896-1901) 345–.
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— —, temperature of transformation in presence of other nitrates. *Bellati, M., & Lussana, S.* Ven. I. At. (1890-91) 995–.

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—, — — work and electricity. *Leblanc, M.* Lum. Élect. 3 (*1881) 199–, 213–, 230–.
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—, theory. *Heintz, W.* Halle Z. Nw. 1 (1853) 417–.
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—. *Wenham, F. H.* (XII) Am. Mcr. J. 1 [(1878–79)] 186–; 1 (1880) 101–.
—. *Moore, A. J.* Mcr. S. J. 4 (1884) 453–.
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—, diatom, and true form of diatom markings. *Reade, J. B.* M. Mcr. J. 2 (1869) 5–.
—, doubly reflecting. *Gray, P.* Mcr. J. 1 (1861) 273–.
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—, Nachet's. *Shadbolt, G.* [1850] Mcr. S. T. 3 (1852) 74–.
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—, Beck's. *Anon.* Mcr. S. J. (1899) 338–.
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—, Powell and Lealand's. *Anon.* Mcr. S. J. (1889) 125–.
—, substage, with collar-correction. *Nelson, E. M.* Mcr. S. J. (1895) 229–.
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— —, doublet, new form. *Nelson, E. M.* Mcr. S. J. (1896) 365–.
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—, Kellner eye-piece as. *Maddox, R. L.* Mcr. S. J. 4 (1884) 801–.

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3260 Energy of Sun-light.

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— — — — optical constants of glass. *Hastings, C. S.* Am. J. Sc. 15 (1878) 269–.
— — — — — — — — metals. *Koenigsberger, J.* D. Ps. Gs. Vh. (1899) 247–.
— — — of prism on displacement of spectrum lines. *Blaserna, P.* Arch. Sc. Ps. Nt. 41 (1871) 429–.
— — — on refraction. *Arzruni, A.* A. Ps. C. Beibl. 1 (1877) 400–.
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— —, periscopic, geometric form of theoretical retina. *Matthiessen, H. F. L.* Arch. f. Oph. 25 (1879) (*Ab.* 4) 257–.
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— elements and least angle of vision. *Du Bois-Reymond, C.* Arch. f. Oph. 32 (1886) (*Ab.* 3) 1–.
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— —, — — in vertebrates. *Moennich, P.* Pflüg. Arch. Pl. 40 (1887) 397–.
— —, stratified, differential equations. *Matthiessen, H. F. L.* Pflüg. Arch. Pl. 19 (1879) 480–; Z. Mth. Ps. 24 (1879) 304–; 26 (1881) 179–; 28 (1883) 211–.
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— — optical instrument. *Cherrill, A. K.* Eastbourne NH. S. Pp. (1874–75) (*May*) 2 pp.
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— — —, best form of schemata. *Groenouw, A.* Arch. Augenh. 31 (1895) (*Festschr.*) 73–.
— — —, experimental determination. *Leboucher, —.* Caen Mm. S. L. 13 (1864) *No.* 4, 26 pp.
— — — and spectacles, definition of meridian in estimating. *Knapp, H.* Arch. Augenh. 16 (1886) 195–; Arch. Oph. 15 (1886) 207–.
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4420 Movements of the Eye. Accommodation.

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— — — — —. *Bourdon, B.* Rv. Sc. 43 (1889) 763–.
— — — — —. *Rozier, F.* Rv. Sc. 44 (1889) 26–.
— — — — —. *Rémy, A.* Rv. Sc. 44 (1889) 237–.
Visual appearance of high monuments. *Rozier, F.* Rv. Sc. 44 (1889) 653–.
— — — — objects. *Sorel, G.* Rv. Sc. 45 (1890) 564–.
— axes, inclination. *Prevost, P.* A. C. 14 (1820) 397–.

4450 Colour Vision. Subjective Colours. Colour Blindness.

(*See also* **Physiology, 3735.**)

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Prieur, C. A. A. C. 54 (1805) 5–.
Maxwell, J. C. Ph. Mg. 14 (1857) 40–.
Gladstone, J. H. B. A. Rp. (1860) (*pt.* 2) 12–.
Aitken, J. (IX) Sc. S. Arts T. 8 (1872) 375–.
Peirce, C. S. Am. J. Sc. 13 (1877) 247–.
Weinhold, A. F. A. Ps. C. 2 (1877) 631–.
Hoh, T. (XII) Bamb. Nf. Gs. B. (12) (1882) (*No.* 6) 4 pp.
Swan, J. W. Nt. 26 (1882) 246.
Droop, H. R. L. Ps. S. P. 5 (1884) 217–; Ph. Mg. 15 (1883) 373–.
St. Clair, G. [1884] Birm. Ph. S. P. 4 (1883–85) 117–.
Vogel, H. W. A. Ps. C. 28 (1886) 130–.
Cooke, F. G. [1887] Eastbourne NH. S. T. 2 (1886–94) 35–.
Isaachsen, D. Pflüg. Arch. Pl. 43 (1888) 289–.
Vogel, H. W. Berl. Ps. Gs. Vh. (1888) 56–; Humb. 7 (1888) 315–; Lpldina. 24 (1888) 106–, 128–.
Whitmell, C. T. Card. Nt. S. T. 19 (1888) 67–.
Vogel, H. W. Berl. Ps. Gs. Vh. (1890) 1–.
Roy. Soc. Comm. R. S. P. 51 (1892) 280–.
Guébhard, A. As. Fr. C. R. (1894) (*Pt.* 1) 121.
Nicati, W. C. R. 119 (1894) 917–, 974.
Vogel, H. W. Berl. Ps. Gs. Vh. (1894) 97–; D. Nf. Vh. (1897) (*Th.* 2, *Hälfte* 1) 44–.
Stevens, W. Le C. Science 7 (1898) 513–, 677–.
Titchener, E. B. Science 7 (1898) 603–, 832–.
Franklin, (Mrs.) C. L. Science 7 (1898) 773–; 8 (1898) 329–.
Whitman, F. P. Am. As. P. (1898) 83–.
Apparatus. *Glan, P.* [1880] Pflüg. Arch. Pl. 24 (1881) 307–.
Apparent motion of figures of certain colours. *Loomis, E.* Am. As. P. (1850) 293–; (1851) 78–.
Bichromatic vision. *Stephenson, J. W.* M. Mcr. J. 7 (1872) 215–.
Brightness of pigments by oblique vision. *Whitman, F. P.* Science 9 (1899) 734–.
Chromatrope, new. *Morton, H.* A. Ps. C. 157 (1876) 150–.
Chromostroboscopic experiments. *Riccò, A.* Mod. S. Nt. An. 10 (1876) 31–.
Colorimeter. *Houton de la Billardière, J. J.* Rouen Tr. Ac. (1827) 73–.
—. *Beek, A. van.* Amst. N. Vh. 2 (1829) 217–; Schweigger J. 62 (=*Jb.* 2) (1831) 246–.
—. *Müller, Alex.* Erdm. J. Pr. C. 60 (1853) 474–.

Colorimeter. *Ilosvay, L.* [1892] Termt. Közl. 25 (1893) 158–; Mth. Nt. B. Ung. 11 (1894) 426.
—, complementary. *Müller, Alex.* Erdm. J. Pr. C. 66 (1855) 193–; Fresenius Z. 2 (1863) 143–.
—, detached, and colorimetry. *Mills, E. J.* Ph. Mg. 7 (1879) 437–.
—, portable. *Mills, E. J.* Glasg. Ph. S. P. 10 (1877) 310–.
Colour box, experiments with Lord Rayleigh's. *Schuster, A.* [1890] R. S. P. 48 (1891) 140–.
— change apparatus. *Hessel, J. F. C.* Pogg. A. 79 (1850) 442–.
— combinations by polarised light. *Spottiswoode, W.* [1874] R. S. P. 22 (1874) 354–; R. I. P. 7 (1875) 291–.
— constants. *Rood, O. N.* J. Sc. 6 (1876) 458–.
— — and intensity of clouded light for chromometry. *Müller, Alex.* D. C. Gs. B. 4 (1871) 105–.
— discrimination, formation of shadow and perspective in. *Einthoven, W.* Brain 16 (1893) 191–; Ndl. Gast. Oogl. Vs. 35 (1894) 14 pp.
— and distance, relation between perception. *Rood, O. N.* Silliman J. 32 (1861) 184–.
— map, construction. *Baily, W.* [1892] L. Ps. S. P. 11 (1892) 323–; 12 (1894) 1–; Ph. Mg. 33 (1892) 496–; 35 (1893) 46–.

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Challis, J. Ph. Mg. 12 (1856) 521–.
Baumeister, (Prof.) —. Carlsruhe Vh. Nw. Vr. 2 (1866) 8–.
Moutier, J. [1882–83] Par. S. Phlm. Bll. 7 (1883) 19–; Lum. Élect. 8 (*1883) 22–.
Schelske, L. E. R. A. Ps. C. 16 (1882) 349–.
(Lecture experiment.) *Vogel, H. W.* Berl. Ps. Gs. Vh. (1887) 28–.
apparatus. *Ketteler, E.* A. Ps. C. 141 (1870) 604–.
—. *Szilágyi, E.* (XII) Orv.-Term. Éts. 6 (1881) (*Orv. Szak*) 60–.
—. *Hoffert, H. H.* L. Ps. S. P. 6 (1885) 200–; Ph. Mg. 18 (1884) 81–.
—. *Aitken, J.* Edinb. R. S. P. 13 (1886) 122–.
—, new Helmholtz. *Schmidt, F., & Haensch,* —. Z. Instk. 13 (1893) 200–.
binocular. *Bezold, W. von.* (VII) Pogg. A. (*Jubelbd.*) (1874) 585–.
calculation. *Lommel, E.* Münch. Ak. Ab. 17 (1892) 491–.
by dissolved dyes. *Klobukow, N. von.* A. Ps. C. 43 (1891) 438–.
homogeneous colours. *Helmholtz, H.* B. A. Rp. (1853) (*pt.* 2) 5; Fechner Cb. 1 (1853) 3–.
— —. *Preyer, W. T.* Bonn. Cor.-Bl. NH. Vr. (1868) 57–.
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law. *König, W.* Frkf. a. M. Ps. Vr. Jbr. (1897–98) 35–.
—, Newton's. *Bezold, W. von.* Berl. Ps. Gs. Vh. (1887) 55 (*bis*)–.
law, Newton's. *Hering, E.* Lotos 35 (1887) 177–.
—, —. *König, A.* Berl. Ak. Sb. (1887) 311–.
—, —. *Tonn, E.* Z. Psychol. 7 (1894) 279–.
—, —, in green blindness. *Brodhun, E.* Z. Psychol. 5 (1893) 323–.
method. *Bezold, W. von.* Münch. Ak. Sb. 6 (1876) 106–.
—. *Hilbert, R.* Humb. 3 (1884) 257–.
monocular. *Szilágyi, E.* (XII) Cb. Md. Ws. 19 (1881) 513–.
optical and mechanical, differences. *Petruševskij, T. T.* Rs. Ps.-C. S. J. 25 (*Ps.*) (1893) 264.
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—. *Grailich, W. J.* Wien SB. 12 (1854) 783–; 13 (1854) 201–.
—, and colour vision. *Bohn, C.* A. Ps. C. 125 (1865) 87–.

Colour patterns in natural productions. *Higgins, H. H.* Lpool. Lt. Ph. S. P. 11 (1856–57) 133–.
— photometry in spectrum. *Abney, (Capt.) W. de W., & Festing, (Maj.-Gen.) E. R.* [1886] Phil. Trans. 177 (1887) 423–.
— of red or yellow objects viewed through red or yellow glass. *Le Gentil,* —. A. C. 10 (1791) 225–.
— scale. *Biot, J. B.* Par. S. Phlm. Bll. (1816) 144–; (1818) 90–.
— —, Newtonian. *Govi, G.* C. R. 105 (1887) 733–.
— scheme, standard. *Pillsbury, J. H.* [1892–95] Science 19 (1892) 114; 21 (1893) 310–; Nt. 52 (1895) 390–; 53 (1895–96) 55.
— sensations, mathematical representation. *Feret, R.* C. R. 102 (1886) 44–, 256–, 608–.
— —, persistence. *Stein, W.* J. Pr. C. 113 (1872) 328–.
— sense, determination by spectroscope. *Donders, F. C.* (XII) Amst. Ak. Wet. P. (1880–81) (*No.* 8) 2–.
— —, intensity distribution in spectrum. *König, A., & Dieterici, C.* Berl. Ak. Sb. (1886) 805–; Z. Psychol. 4 (1893) 241–.
— systems. *Donders, F. C.* [1880–84] Utr. Oz. 6 (1881) 79–; 8 (1883) 1–; Arch. f. Oph. 30 (1884) (*Ab.* 1) 15–.
— —. *Rood, O. N.* [1891] Am. J. Sc. 44 (1892) 263–.
— —. *Kries, J. von.* Z. Psychol. 13 (1897) 241–, 473.
— —, dichromatic. *Donders, F. C.* [1878] (XII) Amst. Ak. Wet. P. (1878–79) *No.* 6, 3–.
— —, —. *König, A.* A. Ps. C. 22 (1884) 567–.
— —, shortest lines in. *Helmholtz, H. von.* Berl. Ak. Sb. (1891) 1071–.
— —, trichromatic. *Kries, J. von.* Z. Psychol. 19 (1899) 63–.
— top, cinephantic. *Hunt, E.* [1859] Glasg. Ph. S. P. 4 (1860) 252–.
— triangles by mixtures of real colours. *Bezold, W. von.* [1885] Münch. Ak. Sb. 15 (1886) 305–.
Coloured glasses, binocular vision through. *Dove, H. W.* Pogg. A. 101 (1857) 147–; Berl. Mb. (1861) 1054–.

Coloured glasses, optical observation with. *Marx, C. M.* D. Nf. Vsm. B. (1843) 235.
— light, action on retina, experiments. *Pergens, É.* I. Solvay Tr. 1 (*Fasc.* 2) (1897) 38 pp.
— surfaces, efficiency of eye in distinguishing two. *Broca, A.* Par. S. Ps. Sé. (1894) 119–.
— —, reflex action in artists' studios. *Wiener, L. C.* [1880] (XII) Karlsruhe Nt. Vr. Vh. 8 (1881) 265–; 9 (1883) 10–.

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analogy and harmony. *Hargreaves, T.* Tilloch Ph. Mg. 50 (1817) 128–.
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brown, nature. *Brücke, E.* Pogg. A. 74 (1849) 461–.
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—. *Doppler, C.* Böhm. Gs. Ab. 5 (1847) 401–.
—. *Forbes, J. D.* Ph. Mg. 34 (1849) 161–; Edinb. R. S. P. 2 (1851) 214–.
— and definition. *Rosenstiehl, A.* As. Fr. C. R. (1878) 303–.
— in series. *Carpentier, J.* C. R. 100 (1885) 808–.
comparisons. *Donders, F. C.* Utr. Oz. 8 (1883) 170–; 9 (1884) 43–; Arch. An. Pl. (*Pl. Ab.*) (1884) 518–.

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Breda, J. G. S. van. Gilbert A. 54 (1816) 321–.
Osann, G. Pogg. A. 37 (1836) 287–; 42 (1837) 72–.
Maumené, E. J. (VIII) Reims Sé. Ac. 11 (1850) 274–.
Meyer, M. H. Pogg. A. 95 (1855) 170–.
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Murphy, J. J. Nt. 16 (1877) 208.
Rosenstiehl, A. Par. S. Ps. Sé. (1883) 8–.
apparatus. *Müllendorff, A.* Lux. S. Sc. Mm. 10 (1869) 137–.
—. *Petruševskij, T. T.* Rs. Ps.-C. S. J. 29 (*Ps.*) (1897) 1–.
and decolorisation of yellow diamonds. *Chatrian, N., & Jacobs, —.* C. R. 95 (1882) 759–.
decomposition of white light into. *Bezold, W. von.* A. Ps. C. 32 (1887) 165–.
determination of wave-lengths. *König, A.* Berl. Ps. Gs. Vh. (1884) 37–.
fundamental law. *Glan, P.* Wien Ak. Sb. 92 (1886) (*Ab.* 2) 906–; A. Ps. C. 48 (1893) 307–.
investigation with Brücke's schistoscope. *Ditscheiner, L.* Wien Sb. 63 (1871) (*Ab.* 2) 554–.
measurements. *König, A.* Berl. Ak. Sb. (1896) 945–.
phenomena. *Suckow, G.* Pogg. A. 39 (1836) 325–.
problem. *Miquel, A.* N. A. Mth. 5 (1846) 235–.
and white, sensation. *Rosenstiehl, A.* C. R. 95 (1882) 1275–.

composition. *Mascart, É. É. N.* [1874] Par. S. Ps. Sé. (1875) 7–.
—. *De la Rive, L.* Arch. Sc. Ps. Nt. 19 (1888) 391–.
—, theory. *Challis, J.* Ph. Mg. 12 (1856) 329–.
—, — (Challis). *Stokes, G. G.* Ph. Mg. 12 (1856) 421–.
compound, theory. *Helmholtz, H.* Müller Arch. (1852) 461–.
—, — (Helmholtz). *Plateau, J. A. F.* Pogg. A. 88 (1853) 172–.
—, —, with reference to mixtures of blue and yellow light. *Maxwell, J. C.* B. A. Rp. (1856) (*pt.* 2) 12–.
—, —, and relations of colours of spectrum. *Maxwell, J. C.* Phil. Trans. (1860) 57–; R. S. P. 10 (1859–60) 484–.
of daylight and artificial light. *Memorsky, M.* Wien Sb. 53 (1866) (*Ab.* 2) 345–.
differences by night and day. *Nicklès, J.* J. Phm. 4 (1866) 270–.
—, smallest perceptible, alteration of wave-length of light necessary to produce. *Uhthoff, W.* [1888] Arch. An. Pl. (*Pl. Ab.*) (1889) 171–.
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examination, and appearances under artificial lights. *Paterson, D.* S. Dyers Col. J. 12 (1896) 191–.
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—. *Abert, (Col.) J. W.* Cincin. S. NH. J. 7 (1884) 167–.
—. *Vogel, H. W.* Wien Pht. Cor. 31 (1894) 263–.
—, theory. *Unger, F. W.* Pogg. A. 87 (1852) 121–.
—, — (Unger). *Plateau, J. A. F.* Pogg. A. 88 (1853) 172–.
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—, — — —. *J., J. R.* L. Pol. Mg. 2 (1845) 171–.
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— — — — — —, — — sodium yellow. *Donders, F. C.* Amst. Ak. Wet. P. (1883–84) *No.* 9, 9–.
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—, improved artificial light for. *Dufton, A., & Gardner, W. M.* S. Dyers Col. J. 16 (1900) 238–.
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mutual behaviour. *Seebeck, T. J.* Schweigger J. 1 (1811) 4–.
natural, production, and law of colour mixture. *König, W.* Frkf. a. M. Ps. Vr. Jbr. (1897–98) 36–.
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— — — — — — — (Chauveau). *Guébhard, A.* Par. S. Ps. Sé. (1893) 129–.
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perimetry. *Hegg, E.* Arch. f. Oph. 38 (1892) (*Ab.* 3) 145–.
phenomena on intermittent stimulation with white light. *Percival, A. S.* [1899] Durham Un. Ph. S. P. 1 (1900) 219–.
—, new apparatus for studying. *Nardroff, E. R. von.* Science 2 (1895) 352.
pigment-, analysis. *Kolbe, B.* Arch. f. Oph. 30 (1884) (*Ab.* 2) 1–, 288, (*Ab.* 4) 313–.
polarity. *Himly, (Dr.) C.* Oph. Bb. 1 (1802) (*pte.* 2) 1–.
power of distinguishing, quantitative determination. *Donders, F. C.* Donders Ndl. Gast. Oogl. Vs. 18 (1877) 77–; Arch. Néerl. 13 (1878) 91–.

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Brewster, (Sir) D. B. A. Rp. (1855) (*pt.* 2) 7–.
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Wilser, —. Karlsruhe Nt. Vr. Vh. 10 (1888) (*Sb.*) 176–.
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— and nature. *Anon.* (VI 535) Gergonne A. Mth. 10 (1819–20) 228–.
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—. *Preyer, W.* Z. Psychol. 11 (1896) 405–.
white light composed of 4 colours. *Fusinieri, A.* A. Sc. Lomb. Ven. 2 (1832) 337–; 12 (1842) 94–.

problem. *Franklin, (Mrs.) C. L.* Science 12 (1900) 408–.
production. *Young, (Dr.) T.* Phil. Trans. (1802) 387–.
purple obtained by recombination of 2 colours of solar spectrum. *Koechlin, C.* C. R. 103 (1886) 432–.
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relative intensity. *Rosenstiehl, A.* Par. S. Ps. Sé. (1882) 103–; C. R. 94 (1882) 1411–.
— —; effect of illumination. *Dove, H. W.* Berl. B. (1852) 69–.
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— —, —. *Rochas, — de.* Midl. Ntlist. 8 (1885) 141.
— —, —. *Gheyn, (le rév. père) — van den.* Brux. S. Sc. A. 9 (1885) (*Pt.* 1) 69–.
— —, —. *Gruber, É.* Rv. Sc. 51 (1893) 394–.
— —, —. *Wallian, S. S.* Science 21 (1893) 360.
— —, — in the blind. *Philippe, J.* Rv. Sc. 1 (1894) 806–.

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Davies, J. A. [1861] Edinb. N. Ph. J. 15 (1862) 187–.
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changes in tone from fatigue of retina by homogeneous light. *Hess, C.* Arch. f. Oph. 36 (1890) (*Ab.* 1) 1–.
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—. *Helmholtz, H.* Pogg. A. 94 (1855) 1–.
—. *Frey, M. von, & Kries, J. von.* Arch. An. Ph. (*Pl. Ab.*) (1881) 336–.
and their mixtures, apparatus for study of luminous and chromatic intensities. *Parinaud, —.* Par. S. Ps. Sé. (1884) 206–.
number and brightness. *König, A.* Z. Psychol. 8 (1895) 375–.
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